LPMS LASER POWER MEASUREMENT SYSTEMS

Accurate, reproducible method of determining total laser and laser diode power

**POWER MEASUREMENT RANGE** for LPMS-040-SF-SI system (AS-02492-100)

*The above graph indicates the maximum power that can be introduced in the sphere before detector saturation appears. The maximum usable power range for Labsphere's LPMS systems is determined by the thermal stability limits of the sphere coating/material, which should not exceed 400°C for Spectralon, 100°C for Spectraflect, and 500°C for Infragold.*

**OPTIMAL DESIGN FOR BEAM POWER MEASUREMENTS**

The Labsphere Laser Power Measurement Systems (LPMS) series assures an accurate, reproducible method of determining the total power from a collimated or divergent laser or laser diode. Specifically designed for laser applications, LPMS spheres are ideal for measuring the total power of a beam of optical radiance. Because of the unique geometry of the sphere, beam power measurements are independent of beam polarization, and are insensitive to beam alignment.

The attenuation which accompanies the sphere throughout also alleviates detector saturation. The systems can be used with an open port and can be apertured with an array of optional fiber adaptors for laser diode modules or port reducers.

**FEATURES:**
- Spectraflect, Infragold or Spectralon sphere interiors for reduced alignment sensitivity
- Sturdy port frames for mounting fiber accessories
- Second detector port for a spectrometer or additional fiber
- Three integrating sphere size options
- Three detector options
- NIST traceable system calibrations

**BEST FOR MEASURING:**
- Lasers
- Laser diodes
- Laser diode modules
- Divergent monochromatic sources

**ACCURATE**

An input port that permits a beam of radiation is machined into the sphere. A detector, located 45° from the entrance port, views the sphere wall next to the entrance port. The field of view of the detector is designed to limit the viewing area so that highly divergent sources may be input without affecting measurement accuracy.

The systems provide options for laser power measurement over the 300 to 1800 nm wavelength region for optical powers ranging from 0.1uw to hundreds of watts. The system's calibrations are traceable to the National Institute of Standards and Technology (NIST).

**FLEXIBLE DESIGN**

Each system consists of a laser power measurement sphere, post, post holder and base assembly, a detector assembly, SC 6000 programmable radiometer/photometer and multi-wavelength calibration. A second detector port gives the user the flexibility to add an additional detector assembly for broader spectral sensitivity, or add a spectrometer for spectral characterization.
Specifications

Model | Coating | SI | GE | IN
--- | --- | --- | --- | ---
LPMS-020-XX-YY | SF | AS-02489-100 | AS-02489-300 | AS-02489-400
SL | AS-02488-100 | AS-02488-300 | AS-02488-400
IG | AS-02490-100 | AS-02490-300 | AS-02490-400
LPMS-040-XX-YY | SF | AS-02492-100 | AS-02492-300 | AS-02492-400
SL | AS-02491-100 | AS-02491-300 | AS-02491-400
IG | AS-02496-100 | AS-02496-300 | AS-02496-400
LPMS-060-XX-YY | SF | AS-02495-100 | AS-02495-300 | AS-02495-400
SL | AS-02493-100 | AS-02493-300 | AS-02493-400
IG | AS-02497-100 | AS-02497-300 | AS-02497-400

XX: Coatings: SF Spectrafill, SL Spectralon, IG Infragold
YY: Detectors: (Si) Silicon, (Ge) Germanium, (IN) InGaAs Indium Gallium Arsenide

System Includes:
- Laser Power Measurement Sphere: 2 inch, 4 inch, or 6 inch
- Detector: Si, Ge, or InGaAs
- SCC-PM Calibration
- SC 6000 Radiometer/Photometer

System Properties and Performance

<table>
<thead>
<tr>
<th>System Specifications</th>
<th>LPMS-020</th>
<th>LPMS-040</th>
<th>LPMS-060</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sphere Diameter</td>
<td>2 inch (5 cm)</td>
<td>4 inch (10 cm)</td>
<td>6 inch (14.4 cm)</td>
</tr>
<tr>
<td>Entrance Port Frame Diameter</td>
<td>0.5 inch (12.7 mm)</td>
<td>1 inch (2.5 cm)</td>
<td>1 inch (2.5 cm)</td>
</tr>
<tr>
<td>Sphere Coating Reflectance</td>
<td>98% Spectrafill</td>
<td>99% Spectralon</td>
<td>95% Infragold</td>
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</tbody>
</table>

Detector Port #1 (holds standard 12.7mm diameter optical filters) For system detector
Detector Port #2 (holds standard 12.7mm diameter optical filters) Use for optional second detector, fiber spectrometer for spectral characterization, or cap when not in use

Laser Power Measurement System Standards Calibration

<table>
<thead>
<tr>
<th>Detector System</th>
<th>Standard Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si Detector System</td>
<td>SCC-PM-SI 300 nm to 1100 nm in 25 nm increments LPMS, Silicon</td>
</tr>
<tr>
<td>Ge Detector System</td>
<td>SCC-PM-GE 800 nm to 1800 nm in 25 nm increments LPMS, Germanium</td>
</tr>
<tr>
<td>InGaAs Detector System</td>
<td>SCC-PM-IN 900 nm to 1700 nm in 25 nm increments LPMS, InGaAs</td>
</tr>
</tbody>
</table>

Each standard system comes with a multiple wavelength spectral responsivity calibration. The SC 6000 radiometer is programmed to display the laser optical power in units of watts.

Detector

<table>
<thead>
<tr>
<th>Silicon</th>
<th>Germanium</th>
<th>InGaAs</th>
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</thead>
<tbody>
<tr>
<td>Active Area</td>
<td>4.5 mm²</td>
<td>19.6 mm²</td>
</tr>
<tr>
<td>Range</td>
<td>190 - 1100 nm</td>
<td>800 - 1800 nm</td>
</tr>
<tr>
<td>Peak Responsivity (A/W)</td>
<td>0.5 a/w @950 nm</td>
<td>0.9 a/w @1550 nm</td>
</tr>
</tbody>
</table>

Radiometer/Photometer

<table>
<thead>
<tr>
<th>SC 6000</th>
<th>Power Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>110./220 VAC, 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Current Dynamic Range</td>
<td>1 pA – 20 mA</td>
</tr>
<tr>
<td>Computer Interface</td>
<td>Ethernet</td>
</tr>
</tbody>
</table>

Optional Calibration


Optional Accessories

Fiber Adaptors
Detectors
Optical Filters
Port Plugs

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